

wwPDB EM Validation Summary Report (i)

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PDB ID	:	6YBS
EMDB ID	:	EMD-10772
Title	:	Structure of a human 48S translational initiation complex - head
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Deposited on	:	2020-03-17
Resolution	:	3.10 Å(reported)

This is a wwPDB EM Validation Summary Report for a publicly released PDB entry.

We welcome your comments at *validation@mail.wwpdb.org* A user guide is available at https://www.wwpdb.org/validation/2017/EMValidationReportHelp with specific help available everywhere you see the (i) symbol.

The types of validation reports are described at http://www.wwpdb.org/validation/2017/FAQs#types.

The following versions of software and data (see references (i)) were used in the production of this report:

EMDB validation analysis	:	0.0.1. dev 92
Mogul	:	1.8.4, CSD as541be (2020)
MolProbity	:	4.02b-467
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure: $ELECTRON\ MICROSCOPY$

The reported resolution of this entry is 3.10 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	$egin{array}{c} { m Whole \ archive} \ (\#{ m Entries}) \end{array}$	${f EM\ structures}\ (\#{ m Entries})$
Clashscore	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826
RNA backbone	4643	859

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for $\geq=3, 2, 1$ and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq=5\%$ The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion < 40%). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain	
1	x	548	6% 64% • 34%	
2	с	317	96%	• •
3	n	69	• 91%	9%
4	Х	135	51% 6% • 42%	
5	h	119	87%	13%
6	О	320	23% • 76%	
7	a	165	59% • 40%	

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Mol	Chain	Length	Quality of chain	
8	m	132	84%	8% 8%
9	i	56	89%	11%
10	b	145	74% •	24%
11	Z	243	83%	10% 7%
12	d	145	96%	
13	е	125	50% • 47%)
14	f	152	91%	• 7%
15	V	204	79%	10% • 10%
16	k	156	31% • 66%	
17	Y	146	87%	10% •
18	А	1869	18% 8% • 73%	

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2 Entry composition (i)

There are 20 unique types of molecules in this entry. The entry contains 28732 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

• Molecule 1 is a protein called Eukaryotic translation initiation factor 3 subunit D.

Mol	Chain	Residues		At	AltConf	Trace			
1	х	360	Total 2317	C 1421	N 435	0 453	S 8	0	0

• Molecule 2 is a protein called Receptor of activated protein C kinase 1.

Mol	Chain	Residues		At	AltConf	Trace			
2	с	313	Total 2436	C 1535	N 424	0 465	S 12	0	0

• Molecule 3 is a protein called 40S ribosomal protein S28.

Mol	Chain	Residues		Ate	\mathbf{oms}	AltConf	Trace		
3	n	63	Total	С	Ν	Ο	\mathbf{S}	0	0
5	П	11 05	498	302	101	93	2	0	0

• Molecule 4 is a protein called 40S ribosomal protein S17.

Mol	Chain	Residues		At	oms	AltConf	Trace		
4	Х	78	Total 641	C 403	N 127	0 109	$\begin{array}{c} \mathrm{S} \\ \mathrm{2} \end{array}$	0	0

• Molecule 5 is a protein called 40S ribosomal protein S20.

Mol	Chain	Residues		At	\mathbf{oms}	AltConf	Trace		
5	h	103	Total 817	C 511	N 155	0 147	${S \over 4}$	0	0

• Molecule 6 is a protein called Eukaryotic translation initiation factor 3 subunit G.

Mol	Chain	Residues		Ato	ms	AltConf	Trace	
6	О	77	Total 616	C 389	N 111	O 116	0	0



• Molecule 7 is a protein called 40S ribosomal protein S10.

Mol	Chain	Residues		At	oms	AltConf	Trace		
7	a	99	Total 834	C 544	N 149	0 135	S 6	0	0

• Molecule 8 is a protein called 40S ribosomal protein S12.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	m	199	Total	С	Ν	0	S	0	0
0	111	122	950	596	168	177	9	0	0

• Molecule 9 is a protein called 40S ribosomal protein S29.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	i	50	Total 419	C 262	N 85	O 67	${f S}{5}$	0	0

• Molecule 10 is a protein called 40S ribosomal protein S15.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	b	110	Total 913	C 580	N 168	0 158	S 7	0	0

• Molecule 11 is a protein called 40S ribosomal protein S3.

Mol	Chain	Residues		At	AltConf	Trace			
11	Z	227	Total 1765	C 1125	N 317	0 315	S 8	0	0

• Molecule 12 is a protein called 40S ribosomal protein S19.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	d	142	Total 1105	C 692	N 213	0 197	${ m S} { m 3}$	0	0

• Molecule 13 is a protein called 40S ribosomal protein S25.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	е	66	Total 523	C 338	N 93	0 91	S 1	0	0

• Molecule 14 is a protein called 40S ribosomal protein S18.



Mol	Chain	Residues		At	AltConf	Trace			
14	f	142	Total 1176	C 737	N 239	O 199	S 1	0	0

• Molecule 15 is a protein called 40S ribosomal protein S5.

Mol	Chain	Residues		At	oms	AltConf	Trace		
15	V	184	Total 1461	C 914	N 276	0 264	${f S}7$	0	0

• Molecule 16 is a protein called Ubiquitin-40S ribosomal protein S27a.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	k	53	Total 435	C 276	N 82	O 70	S 7	0	0

• Molecule 17 is a protein called 40S ribosomal protein S16.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	Y	141	Total 1124	C 715	N 212	0 194	${ m S} { m 3}$	0	0

• Molecule 18 is a RNA chain called 18S rRNA.

Mol	Chain	Residues		A	AltConf	Trace			
18	Λ	501	Total	С	Ν	Ο	Р	0	0
10	Л	501	10672	4764	1893	3514	501	0	0

• Molecule 19 is MAGNESIUM ION (three-letter code: MG) (formula: Mg) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms	AltConf
19	f	1	Total Mg 1 1	0
19	А	28	TotalMg2828	0

• Molecule 20 is ZINC ION (three-letter code: ZN) (formula: Zn) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms	AltConf
20	k	1	Total Zn 1 1	0



3 Residue-property plots (i)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion in map density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red diamond above a residue indicates a poor fit to the EM map for this residue (all-atom inclusion < 40%). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.





• Molecule 2: Receptor of activated protein C kinase 1





MET 62 18 14 14 14 15 15 16 15 15 15 15 15 15 15 15 15 15 15 15 15	ARG ARG ARG ARG ARG ASP ARC ARL ALA ALA ALA ALA ALA ALA ALA ALA ALA	GLU TLE TLE TLE GLU ASP ASP ASP ASP ASP ASP ASP ASP ASP ASP	LYS LEU ASP ASP ASP CLY SER SER ASN LEU CLN
VAL VAL GLN GLN PRO THR VAL VAL ASN PHE THR PHE PRO CLY PRO VAL VAL			
• Molecule 5: 40S ribosoma	l protein S20		
Chain h:	87%		13%
MET ALLA PHE LYS ALSP ALA ALYS THR THR PRO CLV VAL CLV VAL CLV VAL ALA ALA ALA ALA			
• Molecule 6: Eukaryotic tr	anslation initiation	factor 3 subunit G	
Chain o: 23% ·		76%	
PMCT PMC THR ASP ASP PHC ASP PRO PRO PRO PRO PRO CULU CLU CLU CLU CLU	GLU ASP LYS CYS CYS CYS CYS CYS CYS CYS GLU LEU LEU LEU LEU CYS GLY CYS PRO	LEU ALA ALA THR GLY ASP PRO GLU CLU CLU	PR0 GLY ALA PR0 PR0 PR0 CLVS CLV CVAL ILE
ASN GLY ASN ASN THR LYS THR THR THR CIV CIV CIV CIV CIV CIV CIV CIV CIV CIV	LLE VAL ARG PHE PHE ARG GLU TLE CYS SER LYS SER LYS ALA	VAL ALA ARG ARG ARG LYS CYS CLYS CLYS CLY SSER	GLU PHE ASP PRO PRO GLY PRO PRO ALA ALA ALA THR THR
THR VAL SER ASP ASP ASP ASP THR THR THR THR THR THR THR THR CYS CYS CYS	GLU GLU ASP ASP PRO ASP NET ASP LVS LVS CLV CLV CLV VAL VAL	SER CYS ARG CYS CYS CYS CYS CYS CYS CYS ARG ARG	CYS CYS LYS ASP ASP ASP CYS CLY MET CLN CLN CLN CLN
GLU LLEU ALA ALA GLU GLU CLY CLY CLY CLY CLY GLU CLY CLU CLY CLU CLU CLU CLU	GLU VAL VAL ALA ALA ALA ALA GLN CVS CLYS CLYS CLYS CLYS CLYS CLYS CLYS	PRO SER LEU LEU ASP ASC ASC ASC ASC ASC GLU SER SER	MET GLN PRO ASN ASS ASP ASP ASP ASP T240 T240
8286 Maria 4 Luys Pro Ser ASN			
• Molecule 7: 40S ribosoma	l protein S10		
Chain a:	59%	• 40%	
M1 861 999 617 714R 714R 714R 714R 714 714 717 717 717 717 717 717	ALA ALA LEU LEU ARG GLY GLY ALA ASP ASP ASP ARG ARG ARG	SER ALA VAL PRO PRO CLY ALA ASP ALA ALA GLU GLU	GLY ALA CLY SER SER ALA THR THR THR CLU PHE CLU PHE CLU
CLY PHE GLY ARG ARG ARG ARG ARG CLY PRD PRD CLN PRD			
• Molecule 8: 40S ribosoma	l protein S12		
Chain m:	84%		8% 8%
MET ALA GLU GLU GLU GLY MLA ALA ALA ALA ALA ALA ALA CI CI CI CI CI CI CI CI CI CI CI CI CI	C92 194 E117 1124 Y127 Y127 K132		
• Molecule 9: 40S ribosoma	l protein S29		
Chain i:	89%		11%





• Molecule 10: 40S ribosomal protein S15

Chain b:	74% .	24%
MET ALA ALA ALA CLU CLU CLN CLN CLN CLN CLN CLN CLN CLN CLN CLN	ARHE ARHE LIYS LIYS LIYS ARG ARG ARG ARG ARG ARG ARG ARG ARG ARG	
• Molecule 11:	40S ribosomal protein S3	
Chain Z:	83%	10% 7%
M1 R9 E23 E23 E23 F42 F43 F43	144 144 145 145 159 159 106 110 110 110 110 110 110 110 110 110 110 110 110 110 110 110 110 115 115 116 1176 1184	S209 K214 K214 K227 GLY GLY FRO FRO PRO PRO PRO PRO PRO PRO PRO PRO PRO P
PRO VAL PRO THR ALA		
• Molecule 12:	40S ribosomal protein S19	
Chain d:	96%	• •
MET PR0 63 63 63 63 63 63 63 61 74 130 130 130		
• Molecule 13:	40S ribosomal protein S25	
Chain e:	50% • 47	7%
MET PRO PRO LYS ASP ASP LYS LYS LYS ASP	G LLA G LLA LLYS ALA LLYS LLYS LLYS LLYS ASP ASP ASP ASP CLYS CLYS CLYS CLYS CLYS CLYS CLYS CLYS	N45 N45 D51 D51 D51 D51 D51 T45 A74 A76 A76 A80 A80 A80 A80 A80 A80 A80 A80 A80 A80
GLY ASP ALA PRO ALA ALA GLY GLY ASP ALA		
• Molecule 14:	40S ribosomal protein S18	
Chain f:	91%	• 7%
MET SER LEU LEU ET F E112	1145 CLY CLY CLY CLYS LIYS LIYS LIYS	
• Molecule 15:	40S ribosomal protein S5	
Chain V:	79%	10% • 10%
MET THR GLU GLU TRP GLU GLU ALA ALA ALA ALA ALA	ALA ALA THR THR PR0 PR0 A40 V41 K42 V41 K42 K42 K42 K42 K42 K42 K42 K45 K42 K45 K15 M15 M15 M15 M15 M15 M15 M12 M12 M12 M12 M12 M12 M12 M12 M12 M12	CLA CLA CLA CLA CLA CLA CLA CLA CLA CLA
	WORLDWIDE PROTEIN DATA BANK	

1	11111-405 1150somai	protein 527a	
Chain k: 31%	•	66%	
GLN TLE VAL LYS THR LYS THR CLY CLY CLY THR THR THR THR THR THR THR THR	dLU PRO GLU PRO SER ASP THR THR TLE GLU GLU GLU VAL ASN VAL	ALLE ASP LYS ASP LYS GLU PRO PRO PRO PRO GLN CLN CLN CLN CLN CLN	PHE PHE ALA ALA CLY CLN CLU CLU CLU CLU CLU CLU CLU CLU CLU CLU
GLM LYS GLU SER THR SER HEU LEU LEU LEU LEU ARG ARG ARG ARG	ALA ALA LYS LYS LYS LYS LYS SER LYS SER TYR THR THR PRO	ALIN ALIN LYS H93 H93 H93 H93 LY02 V102 V102 ALU ALN ALN ALN ALN ALN	114 114 114 114 114 115 1275 1275 1275 1275 1275 1275 1275
Molecule 17: 40S r	ibosomal protein S1	.6	
Chain Y:	87%		10% •
PRO SER LLYS CLY CLY GLY GLA R27 R33 R32 K33 K33 K33 K33 K33 K33 K33 K33 K33 K	L58 R62 R62 R62 R62 R62 R62 R62 R115 R111 R1118 L119 L1119 L1119		
Molecule 18: 18S r	RNA		
Chain A: 18%	8% •	73%	
. < 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	M M M M M M M M M M M M M M M M M M M		. < 3 U U < D U U < D U D U D U D U D U D U D
:004000400000;) < U < U D U < < < U D U U C	9 4 4 7 8 8 8 7 7 8 4 4 4 4	C C C C C C C C C C C C C C C C C C C
		A A 2M A A 2M	6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
.00000000000000000000000000000000000000	, , , , , , , , , , , , , , , , , , ,		CO < D U < < < < U U < < U U U U U U U U U
< U U D D U U U U U U U A D U U	90400000000000000000000000000000000000	00000)
044000004000	< 0 D 0 0 0 0 0 0 D 0 0 D 4 0) U < D 0 0 D 0 4 0 0 4 0 0 0) O D O A O O O O O O A A D O A O O
	00040000040444)	< < 0 0 4 4 0 0 0 4 0 0 4 0 0 0 0 0 0
M N N N N N N N N N N N N N N N N N N N	00000400000000400 00000000000000000000	T A A A A G O A G U G A A A A A A A A A A A A A A A A) < < () < <) < () < () < () < ())))
- D U O 4 O O U U U D O D 4 4 :) D O O A A D O A O D O U A C	>>	<pre>C D d d d d d d d d d d d d d d d d d d</pre>
A A C C C C C C C C C C C C C C C C C C			C C C C C C C C C C C C C C C C C C C









4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	144882	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE	Depositor
	CORRECTION	
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose $(e^-/\text{\AA}^2)$	107	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	FEI FALCON III (4k x 4k)	Depositor
Maximum map value	0.408	Depositor
Minimum map value	-0.201	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.005	Depositor
Recommended contour level	0.02	Depositor
Map size (Å)	537.0, 537.0, 537.0	wwPDB
Map dimensions	500, 500, 500	wwPDB
Map angles $(^{\circ})$	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.074, 1.074, 1.074	Depositor



5 Model quality (i)

5.1 Standard geometry (i)

Bond lengths and bond angles in the following residue types are not validated in this section: MG, A2M, ZN, JMH, 5MC, PSU

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with |Z| > 5 is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol Chain		Bo	nd lengths	Bond angles		
MOI	Unain	RMSZ	# Z > 5	RMSZ	# Z > 5	
1	Х	0.28	0/2346	0.60	1/3213~(0.0%)	
2	с	0.33	0/2493	0.62	1/3394~(0.0%)	
3	n	0.36	0/500	0.60	0/669	
4	Х	0.35	0/648	0.54	0/863	
5	h	0.36	0/827	0.62	0/1110	
6	0	0.36	0/628	0.68	0/846	
7	a	0.35	0/859	0.51	0/1159	
8	m	0.33	0/960	0.61	0/1286	
9	i	0.40	0/429	0.52	0/568	
10	b	0.38	0/929	0.58	1/1241~(0.1%)	
11	Ζ	0.34	0/1793	0.56	0/2414	
12	d	0.37	0/1123	0.49	0/1504	
13	е	0.34	0/529	0.58	0/712	
14	f	0.33	0/1194	0.56	0/1599	
15	V	0.33	0/1481	0.59	1/1988~(0.1%)	
16	k	0.33	0/444	0.64	0/588	
17	Y	0.37	0/1142	0.59	0/1528	
18	A	0.66	$1/\overline{11830}\ (0.0\%)$	1.14	$76/\overline{18435\ (0.4\%)}$	
All	All	0.49	1/30155~(0.0%)	0.87	80/43117~(0.2%)	

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
18	А	1556	А	N9-C4	5.38	1.41	1.37

The worst 5 of 80 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	$Observed(^{o})$	$Ideal(^{o})$
18	А	1453	С	C2-N1-C1'	10.14	129.96	118.80
18	А	1520	G	C2-N3-C4	9.82	116.81	111.90

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	9	1	1 0				
Mol	Chain	\mathbf{Res}	Type	Atoms	Z	$Observed(^{o})$	$Ideal(^{o})$
18	А	1453	С	N1-C2-O2	9.69	124.72	118.90
18	А	1520	G	N3-C4-C5	-9.50	123.85	128.60
18	А	1578	U	N3-C2-O2	-9.03	115.88	122.20

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There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts (i)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	Х	2317	0	1733	0	0
2	с	2436	0	2393	0	0
3	n	498	0	525	0	0
4	Х	641	0	694	5	0
5	h	817	0	882	0	0
6	0	616	0	600	0	0
7	a	834	0	861	0	0
8	m	950	0	987	0	0
9	i	419	0	415	0	0
10	b	913	0	951	0	0
11	Ζ	1765	0	1865	15	0
12	d	1105	0	1138	0	0
13	е	523	0	573	0	0
14	f	1176	0	1233	0	0
15	V	1461	0	1511	11	0
16	k	435	0	434	0	0
17	Y	1124	0	1193	8	0
18	А	10672	0	5391	35	0
19	A	28	0	0	0	0
19	f	1	0	0	0	0
20	k	1	0	0	0	0
All	All	28732	0	23379	66	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 4.

The worst 5 of 66 close contacts within the same asymmetric unit are listed below, sorted by their



Atom-1	Atom-2	Interatomic	Clash
	1100111 2	distance (Å)	overlap (Å)
18:A:1351:G:H1	18:A:1360:U:H3	1.11	0.92
18:A:1488:C:O2'	18:A:1490:G:OP2	2.14	0.66
11:Z:116:ARG:NH2	11:Z:150:MET:SD	2.75	0.59
18:A:1396:A:O2'	18:A:1398:G:N7	2.34	0.58
11:Z:42:THR:HG22	11:Z:45:ARG:H	1.67	0.58

clash magnitude.

There are no symmetry-related clashes.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all EM entries.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Perce	ntiles
1	х	358/548~(65%)	328 (92%)	30 (8%)	0	100	100
2	с	311/317~(98%)	294 (94%)	17 (6%)	0	100	100
3	n	61/69~(88%)	57~(93%)	4 (7%)	0	100	100
4	Х	76/135~(56%)	73~(96%)	3 (4%)	0	100	100
5	h	101/119~(85%)	95~(94%)	6 (6%)	0	100	100
6	О	75/320~(23%)	73~(97%)	2 (3%)	0	100	100
7	a	97/165~(59%)	93~(96%)	4 (4%)	0	100	100
8	m	120/132~(91%)	116 (97%)	4 (3%)	0	100	100
9	i	48/56~(86%)	45 (94%)	3 (6%)	0	100	100
10	b	108/145~(74%)	105 (97%)	3 (3%)	0	100	100
11	Ζ	225/243~(93%)	219 (97%)	6 (3%)	0	100	100
12	d	140/145~(97%)	133 (95%)	7 (5%)	0	100	100
13	е	64/125~(51%)	60 (94%)	4 (6%)	0	100	100
14	f	140/152~(92%)	136 (97%)	4 (3%)	0	100	100
15	V	180/204~(88%)	169 (94%)	11 (6%)	0	100	100

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	J 1 1 J										
Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles					
16	k	49/156~(31%)	42 (86%)	7 (14%)	0	100 100					
17	Y	139/146~(95%)	133~(96%)	6 (4%)	0	100 100					
All	All	2292/3177~(72%)	2171 (95%)	121 (5%)	0	100 100					

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There are no Ramachandran outliers to report.

5.3.2 Protein sidechains (i)

In the following table, the Percentiles column shows the percent side chain outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all EM entries.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Perce	entiles
1	х	152/494~(31%)	146 (96%)	6 (4%)	32	65
2	с	272/275~(99%)	265~(97%)	7(3%)	46	74
3	n	56/62~(90%)	56 (100%)	0	100	100
4	Х	69/122~(57%)	67~(97%)	2(3%)	42	72
5	h	94/107~(88%)	94 (100%)	0	100	100
6	0	64/277~(23%)	62 (97%)	2(3%)	40	70
7	a	90/136~(66%)	89 (99%)	1 (1%)	73	89
8	m	104/108~(96%)	93~(89%)	11 (11%)	6	26
9	i	44/49~(90%)	44 (100%)	0	100	100
10	b	100/130~(77%)	99~(99%)	1 (1%)	76	90
11	Z	190/202~(94%)	187 (98%)	3(2%)	62	84
12	d	112/115~(97%)	109 (97%)	3(3%)	44	74
13	е	58/103~(56%)	54 (93%)	4 (7%)	15	45
14	f	123/132~(93%)	120 (98%)	3(2%)	49	76
15	V	156/170~(92%)	150 (96%)	6 (4%)	33	66
16	k	47/140 (34%)	43 (92%)	4 (8%)	10	37
17	Y	117/121~(97%)	117 (100%)	0	100	100
All	All	1848/2743 (67%)	1795 (97%)	53 (3%)	45	72



5 of 53 residues with a non-rotameric sidechain are listed below:

Mol	Chain	\mathbf{Res}	Type
8	m	132	LYS
12	d	130	ASP
16	k	102	VAL
10	b	106	GLU
11	Ζ	139	SER

Sometimes side chains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 30 such side chains are listed below:

Mol	Chain	\mathbf{Res}	Type
10	b	103	ASN
15	V	179	ASN
11	Ζ	145	GLN
17	Y	35	ASN
15	V	82	ASN

5.3.3 RNA (i)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
18	А	499/1869~(26%)	97~(19%)	10 (2%)

5 of 97 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
18	А	1207	G
18	А	1208	А
18	А	1209	А
18	А	1215	С
18	А	1216	С

5 of 10 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
18	А	1600	G
18	А	1601	А
18	А	1603	G
18	А	1520	G
18	А	1521	С



5.4 Non-standard residues in protein, DNA, RNA chains (i)

4 non-standard protein/DNA/RNA residues are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with |Z| > 2 is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mal	Turne	Chain	Dec	Tink	Bo	ond leng	$_{\rm ths}$	В	ond ang	les
WIOI	туре	Unam	nes	LIIIK	Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z >2
18	JMH	А	1219	18,19	18,22,23	0.68	1 (5%)	21,32,35	0.64	0
18	A2M	А	1678	18	18,25,26	0.60	0	18,36,39	0.82	1 (5%)
18	PSU	А	1243	18	18,21,22	1.07	2 (11%)	22,30,33	0.68	0
18	5MC	А	1374	18	18,22,23	0.40	0	26,32,35	0.55	0

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	\mathbf{Res}	Link	Chirals	Torsions	Rings
18	JMH	А	1219	18,19	-	0/7/25/26	0/2/2/2
18	A2M	А	1678	18	-	0/5/27/28	0/3/3/3
18	PSU	А	1243	18	-	0/7/25/26	0/2/2/2
18	5MC	А	1374	18	-	0/7/25/26	0/2/2/2

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms		Observed(Å)	$\mathrm{Ideal}(\mathrm{\AA})$
18	А	1243	PSU	C6-C5	3.23	1.39	1.35
18	А	1219	JMH	C5-C4	-2.25	1.37	1.42
18	А	1243	PSU	O4'-C1'	-2.10	1.40	1.43

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	$Observed(^{o})$	$Ideal(^{o})$
18	A	1678	A2M	C5-C6-N6	2.21	123.71	120.35

There are no chirality outliers.

There are no torsion outliers.



There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
18	А	1678	A2M	1	0

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

Of 30 ligands modelled in this entry, 30 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.



6 Map visualisation (i)

This section contains visualisations of the EMDB entry EMD-10772. These allow visual inspection of the internal detail of the map and identification of artifacts.

Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections (i)

6.1.1 Primary map



6.1.2 Raw map



The images above show the map projected in three orthogonal directions.



6.2 Central slices (i)

6.2.1 Primary map



X Index: 250



Y Index: 250



Z Index: 250

6.2.2 Raw map



X Index: 250

Y Index: 250

Z Index: 250

The images above show central slices of the map in three orthogonal directions.



6.3 Largest variance slices (i)

6.3.1 Primary map







Y Index: 240



Z Index: 190

6.3.2 Raw map



X Index: 288

Y Index: 240



The images above show the largest variance slices of the map in three orthogonal directions.



6.4 Orthogonal standard-deviation projections (False-color) (i)

6.4.1 Primary map



6.4.2 Raw map



The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.



6.5 Orthogonal surface views (i)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.02. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map



These images show the 3D surface of the raw map. The raw map's contour level was selected so that its surface encloses the same volume as the primary map does at its recommended contour level.



Mask visualisation (i) 6.6

This section shows the 3D surface view of the primary map at 50% transparency overlaid with the specified mask at 0% transparency

A mask typically either:

- Encompasses the whole structure
- Separates out a domain, a functional unit, a monomer or an area of interest from a larger structure

$emd_{10772}_msk_{1.map}$ (i) 6.6.1







7 Map analysis (i)

This section contains the results of statistical analysis of the map.

7.1 Map-value distribution (i)



The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.



7.2 Volume estimate (i)



The volume at the recommended contour level is 483 $\rm nm^3;$ this corresponds to an approximate mass of 436 kDa.

The volume estimate graph shows how the enclosed volume varies with the contour level. The recommended contour level is shown as a vertical line and the intersection between the line and the curve gives the volume of the enclosed surface at the given level.



7.3 Rotationally averaged power spectrum (i)



*Reported resolution corresponds to spatial frequency of 0.323 ${\rm \AA}^{-1}$



8 Fourier-Shell correlation (i)

Fourier-Shell Correlation (FSC) is the most commonly used method to estimate the resolution of single-particle and subtomogram-averaged maps. The shape of the curve depends on the imposed symmetry, mask and whether or not the two 3D reconstructions used were processed from a common reference. The reported resolution is shown as a black line. A curve is displayed for the half-bit criterion in addition to lines showing the 0.143 gold standard cut-off and 0.5 cut-off.

8.1 FSC (i)



*Reported resolution corresponds to spatial frequency of 0.323 ${\rm \AA}^{-1}$



8.2 Resolution estimates (i)

$\mathbf{Bosolution} \text{ ostimato } (\mathbf{\hat{\lambda}})$	Estimation criterion (FSC cut-off)		
resolution estimate (A)	0.143	0.5	Half-bit
Reported by author	3.10	-	-
Author-provided FSC curve	3.08	3.70	3.13
Unmasked-calculated*	4.13	8.33	4.27

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 4.13 differs from the reported value 3.1 by more than 10 %



9 Map-model fit (i)

This section contains information regarding the fit between EMDB map EMD-10772 and PDB model 6YBS. Per-residue inclusion information can be found in section 3 on page 7.

9.1 Map-model overlay (i)



The images above show the 3D surface view of the map at the recommended contour level 0.02 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.



9.2 Q-score mapped to coordinate model (i)



The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions at which atoms can be resolved. Low Q-score values may therefore be expected for many entries.

9.3 Atom inclusion mapped to coordinate model (i)



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.02).



9.4 Atom inclusion (i)



At the recommended contour level, 97% of all backbone atoms, 96% of all non-hydrogen atoms, are inside the map.



1.0

0.0 <0.0

9.5 Map-model fit summary (i)

The table lists the average atom inclusion at the recommended contour level (0.02) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	$\mathbf{Q} ext{-score}$
All	0.9550	0.5290
А	0.9780	0.5500
V	0.9690	0.5590
Х	0.9680	0.5450
Y	0.9760	0.5780
Z	0.9540	0.5530
a	0.9700	0.5610
b	0.9830	0.5620
с	0.9780	0.5340
d	0.9890	0.5750
е	0.9770	0.5470
f	0.9770	0.5510
h	0.9690	0.5470
i	0.9780	0.5970
k	0.9720	0.4830
m	0.9420	0.4300
n	0.9350	0.5340
0	0.9160	0.4210
Х	0.7600	0.3600

